Impact Of Disruptive Technologies On The Business Ecosystem –Network Virtualization As A Case Study

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Abstract

This work examines the arrival of disruptive technology to the marketplace which causes existing dominant technologies to be displaced impacting their market share. Defining a set of key metrics for a disruptive technology can significantly help technology providers and their partners with strategic decision making processing. Using the key metrics, these players can position their business according to the changing dynamics of the business ecosystem and use it as a leverage to increase their market share. With this motivation, this study aims at defining a set of key metrics for evaluation of a possible disruptive technologies. Network Virtualization impact on the IT and Telecommunication markets is used for demonstrating the metrics identified as a case study. [1]

Introduction

The concept of separating the software from hardware technologies has evolved since the early sixties. This study focuses on the network virtualization, a new technology which focuses on creating independence via a simulation platform by mimicking the hardware functionalities for a given software [2]. Software Defined Networking (SDN) moves the network equipment to be a standardized open box instead of proprietary black boxes. Network function virtualization implements the network functionalities on the software that makes it flexible and standardized by minimizing its dependencies on the underlying hardware.

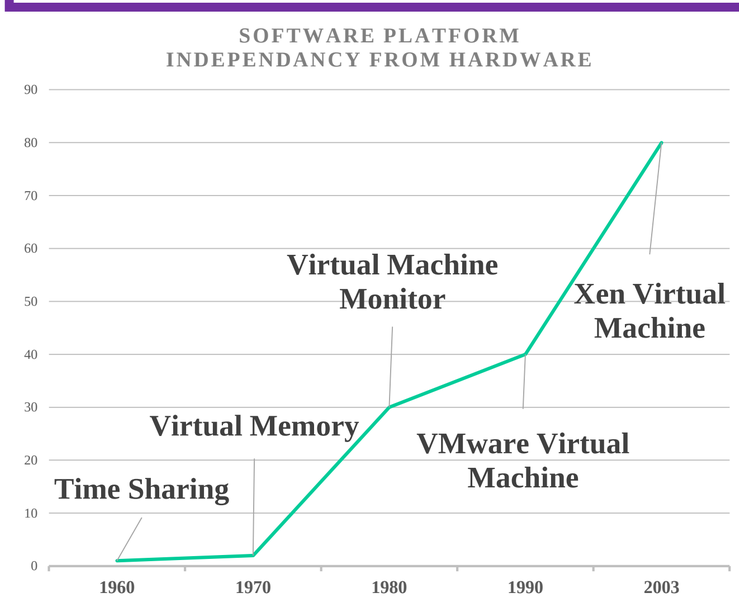

Fig.1 Software Virtualization Evolution Platform "Independency From Hardware"

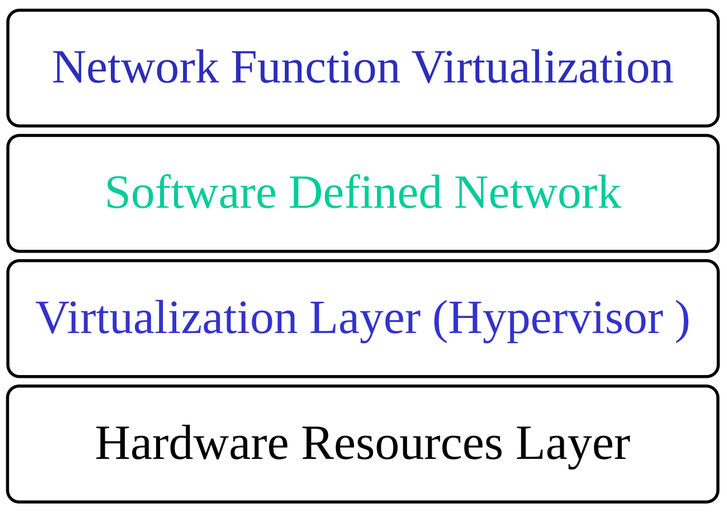

Fig.2 Network Virtualization Framework

Innovation Lifecyle

Today there is no clear distinction among the infrastructure and service providers. Traditional roles of customer, technology provider, and service provider are intertwined. This is mainly due to the role of enterprise Network Virtualization (NV) which created competition or alliances depending on its use or offering. These changing dynamics contribute to a still-developing ecosystem that brings challenges which can also be perceived as business growth opportunities.

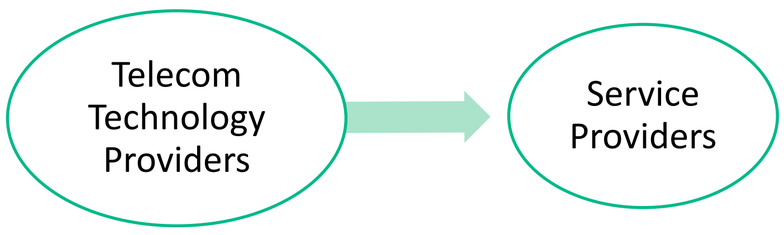

Fig.3 Traditional Relationship Business Ecosystem

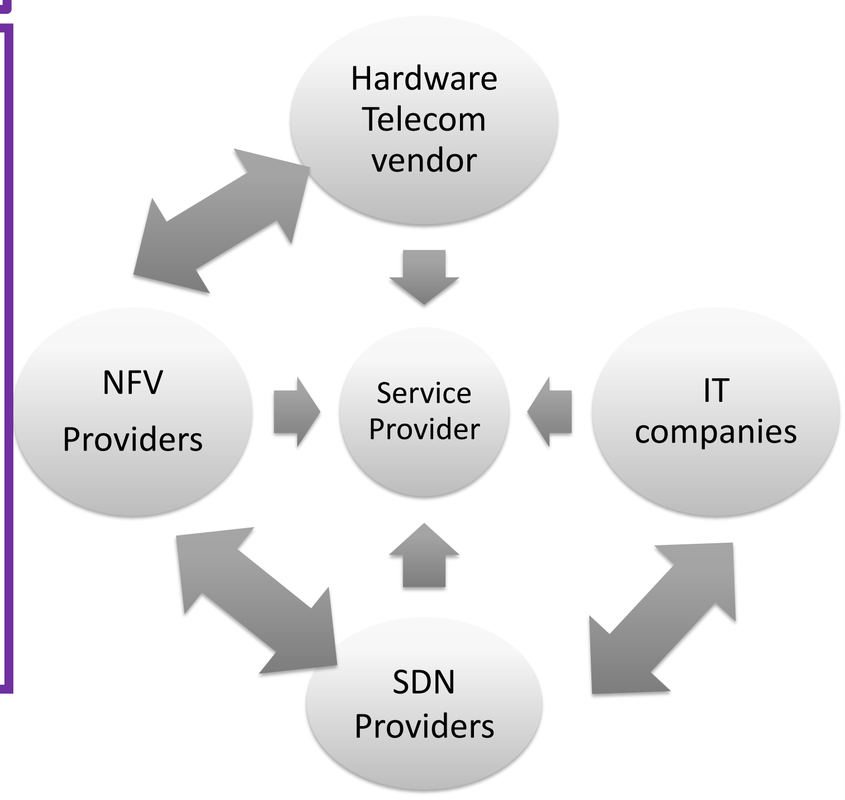

Fig.4 Companies Interdisciplinary Roles in Network Virtualization Business Ecosystem

Maturity and S-Curve (Fig. 5)

This curve explains how the virtualization had been adopted and evolved since its first introduction eighteen years ago [3][5].

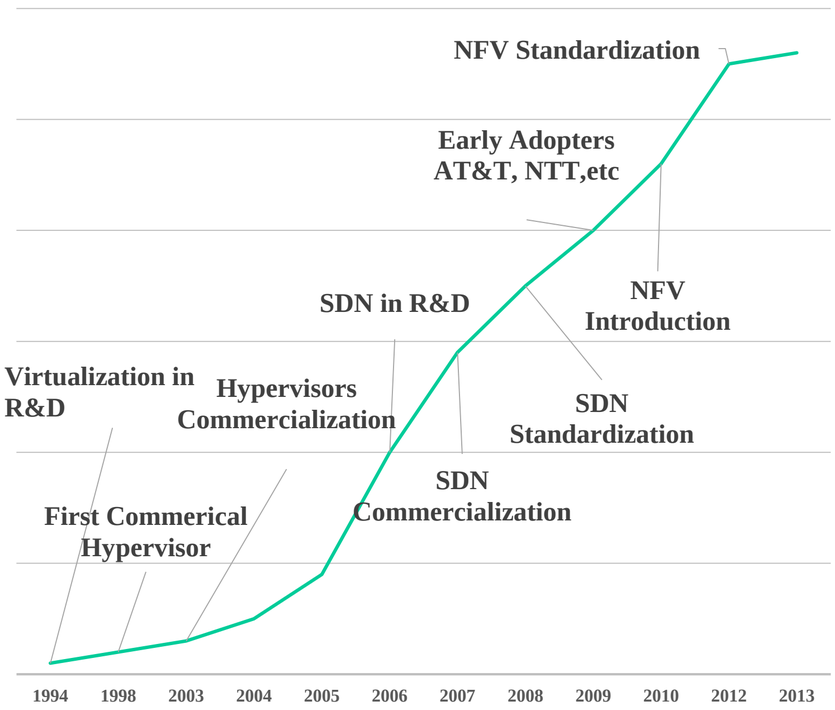

Fig.5 Network Virtualization Adoption Curve

Business Case Studies

VMware is a virtualization vendor founded in 1998. It expanded to acquire Desktone, and CloudVolumes in 2013 and 2014, respectively. VMware had been acquired by EMC in 2004. EMC merged with Dell Inc. in 2016. In 2018 Dell is considered to be acquired by VMware. As a result, Dell and EMC transformed from a traditional PC, server, and storage technology provider into an active player in the SDN and NFV world. In addition, major telecom hardware vendors such as Cisco, and Juniper became active SDN providers.

Disruptive Technology Key Matrices

This research assesses network virtualization using a multiple criteria approach, STEP, to evaluate the impact of the Network Virtualization on the business ecosystem.

Social

In early 2000s the focus of telecom industry was primarily on hardware production more than software development. With the introduction of software development the need for highly technical personnel increased significantly. Today, with the ability of service automation and programmability that SDN brought there is significant reduction on the workforce requirements. However, new jobs such as DevOps have been created as a result of this change [4].

Technological

As illustrated in Fig. 4, network virtualization requires a leap towards programmability and automation. This brings more control over the quality of service provided while allowing more network flexibility as it is more standardized and independent of the underlying hardware. This change also moves more services to the cloud and integrates additional services via the utilization of Internet of Things (IoT).

Economic

SDN and NFV technologies pressurize current technology providers to protect their market share and profitability. These technologies are now influential factors that impact operation costs of service providers' legacy networks [6].

Political

SDN/ NFV changes the market definition and the nature of service providers. In order to adapt to new market structure, services providers might consider establishing partnerships via short and/or long term collaborations and alliances [6].

Conclusion

The network visualization (NV) business ecosystem is still evolving with various hardware vendors and service providers still trying to shape their positions in this new market. The case studies examined in this research showed that the impact of NV on the business ecosystem with a different perspective. Results reveal two essential questions: Should telecom hardware vendors change their transitional business model towards more IT like structures? Shall IT companies change the business ecosystem by acquiring telecom hardware vendors?

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